**Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Cellular Transport Mock Court Cases**

**Introduction:** Cellular transport plays an important role in regulating what goes in and out of our cells as well as helping to maintain homeostasis.

**Directions:** In this activity, you will review the different methods of both active and passive cell transport by investigating mock court cases. Using the list of suspects and crime description for each case as well as the laws listed in the Cellular Transport Code (page 4), your group will decide who is guilty in each case. If your group cannot agree on which suspect is guilty, you will have to discuss the evidence more thoroughly and present your cases to your group members until you can all agree (like a real jury). Be sure to identify all laws that apply (from the Cellular Transport Code on page 4) in order to prove guilt.

**Case One:**

**Possible Suspects:** Osmosis Jones, Bradley Diffusion, Tommy Facilitated-Diffusion

**Crime Description:**

The suspect was seen leaving club “Cellboys” around 2:30 A.M. on Friday, March 23, 2012. The suspect is accused of pushing their way through the club door with no effort applied. The suspect is suspected of moving from the area that was packed with his friends into a secluded area where Susie Sugar was with her sisters Mary Sugar, and Carrie Sugar. He is being accused of becoming too friendly with Susie and trying to mesh with her with his smooth attitude dissolving personality. The witnesses reported that the suspect was like a solvent that melts his way through the girls with ease. Another witness stated he had multiple personalities, that one minute he was positive and the next he was negative and trying to fight off all of the other guys like him in the area. The temperature in the club became quite cold and members of the crowd said that as the suspect was leaving he seemed to float out the door.

1. **We find the suspect \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ guilty of crime 1 based on the following laws presented in the Cellular Transport Code: (list all laws that apply)**

**Case Two:**

**Possible Suspects:** Johnny Endocytosis, Mark Phagocytosis, Jerry Exocytosis, Marty Pinocytosis

**Crime Description:**

The suspect was seen leaving “Cell Flags Amusement Park” around 5:30 P.M. on Saturday, March 24, 2012. The suspect is accused of assaulting Sally H2O around 5:15 P.M. Witnesses say that just prior to the crime; the suspect was seen pushing his way through the massive crowd to the front of the line where Sally was standing alone on the other side of the gate waiting for the next Wheelie ride to start. The second witness stated that he was very aggressive in his approach to get to Sally, that he exerted much effort and energy in his quest. Just prior to the crime, the third witness said she saw the assailant lean in towards Sally. All of the sudden the crowd was shocked as they saw blood pouring out of Sally’s neck where the assailant had consumed a small amount of flesh from her neck. The suspect then disappeared.

1. **We find the suspect \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ guilty of crime 2 based on the following laws presented in the Cellular Transport Code: (list all laws that apply)**

**Case Three:**

**Possible Suspects:** Osmosis Sally, Maggie Diffusion, Jenny Facilitated-Diffusion

**Crime Description:**

The suspect was reported to have quietly entered “CellBuck’s Coffee House” which was sparsely populated on that foggy Saturday morning on March 17, 2012. The first witness reported that the suspect glided in the establishment like a ghost. The suspect was reported to have floated about the room spreading her aromatic charm. The suspect is accused of stealing Mike Hematocytes wallet as she charmed him with her hypnotic aroma. The men that she touched during this experience were reported to have been so mesmerized that they could not recall her features. The female witness stated that just before she left, it was as if she was a magician floating through the air as she disappeared from the establishment back into the foggy mist.

1. **We find the suspect \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ guilty of crime 3 based on the following laws presented in the Cellular Transport Code: (list all laws that apply)**

**Case Four:**

**Possible Suspects**: Mary Endocytosis, Trina Phagocytosis, Brittany Exocytosis, Sherry Pinocytosis

**Crime Description:**

The suspect was reported to have stormed her way into the bar through the thick crowd to an isolated corner where Bobby Nucleus was surrounded by a mass of people. According to one witness, she appeared to engulf the victim with her vicious verbal assault. The second witness stated that it seemed as though she was taking pieces of his spirit with her as she humiliated him in front of the crowd that was sitting around him. Just before, 8:37 P.M. on Monday, April 23, 2012, the suspect was reported to have drawn a 7-8” knife out of her purse and proceeded to cut out the victim’s heart, put it in her bag, push back through the massive crowd into the alley way where the Mardi Gras celebration was occurring and she disappeared into the night.

1. **We find the suspect \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ guilty of crime 4 based on the following laws presented in the Cellular Transport Code: (list all laws that apply)**

**Case Five:**

**Possible Suspects:** Jerry Endocytosis, Mark Phagocytosis, Jeremy Exocytosis, Billy Pinocytosis

**Crime Description:**

The suspect was seen entering the meagerly populated “Philadelphia Cell Zoo.” He was reported to have pushed his way into the establishment through the densely populated petting zoo to crowd the crowded shark tank to quickly get close to Mindy Particle. The first witness says that like a magnet he drew Mindy in with his wit and charm. It was reported by witness number two that it was as though he swallowed her up and contained her away from the rest of the visitors. Witnesses said that it appeared that the suspect travelled with her in his grasp all the way to the exit where it appeared he pushed her out of the establishment into the open outside where the two of them disappeared. She has not been seen since.

1. **We find the suspect \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ guilty of crime 5 based on the following laws presented in the Cellular Transport Code: (list all laws that apply)**

**Abbreviated Annotated Cellular Transport Code, Version 1**

**Section 1.1: Cell Organelles**

SB1.1a. The cell membrane function is primarily to control the passage of materials

into and out of the cell.

SB1.1b. The cell membrane contains proteins that aid in the passage of materials

through the process of facilitated diffusion.

SB1.1c. The cell membrane cannot be penetrated by larger particles by passive

transport means, because they require energy to pass through.

SB1.1d. The cell’s primary goal is to maintain homeostasis through the processes

that are conducted in the cell.

SB1.1e. The cell membrane is a selectively permeable membrane that only allows

the passage of certain materials.

**Section 1.2: Water & Life Processes**

SB1.2a. Passive transport involves the movement of molecules across the cell

membrane with no energy required. Molecules move from high to low

concentration.

1) Diffusion – is the movement of molecules across the cell membrane with no energy required. (ex. Gases, etc.)

2) Osmosis – is the movement of water molecules across the cell membrane with no energy required.

3) Facilitated Diffusion – is a passive transport mechanism that requires a helper molecule to transport molecules across a membrane.

SB1.2b. Active transport involves the movement of molecules across the cell

membrane with the application of energy. Molecules move from low to high

concentration against the gradient.

1) Pinocytosis – is the process of taking in small amount of water or molecules. Energy is required.

2) Endocytosis – is the process of taking molecules from the outside of the cell pulling them through the membrane, often through a protein channel, and wrapping them up in a vesicle. Energy is required.

3) Exocytosis – is the process of taking molecules from the inside of the cell that are wrapped in vesicles and pushing them out of the cell and releasing them. Energy is required.

4) Phagocytosis – is the process of engulfing large molecules. Energy is required.

SB1.2c. Water is a unique molecule that has many properties that distinguish it

from other molecules.

1) Water is known for its ability to be a universal solvent, it easily dissolves materials.

2) Water is a polar molecule which means that it is partially positive at one end and partially negative at the other end.

3) Water when frozen becomes less dense and floats (ice).

4) Water has a cohesive/adhesive property that is responsible for phenomena such as insects walking on water and contact lenses adhering to your eyes.